

ations toward the periphery resembled more a gradual increase of the cell elements ; toward the centre they took more the character of an infiltration.

Lewaschow also experimented by extirpating the lower cervical and upper thoracic ganglia, in order to ascertain whether it would cause any alteration of nutrition in the large vessels of the thorax. Though the experiments were not altogether satisfactory on account of the animals dying too soon, there were found quite pronounced inflammatory alterations in the aorta, especial at the points where the branches were given off. Still, the general phenomena of pleuritis and pyæmia which accompanied these alterations, made it difficult to speak positively as to their cause. He is still continuing the investigations on these points.

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LOCOMOTOR ATAXY.—Dr. George Fischer, *Deutsch Arch. f. Klin. Medicine*, Bd. xxvi, p. 83 (abstr. in *Deutsche Med. Wochenschr.*, No. 38, 1880.)

I. The author calls attention to a peculiar connection between the patellar reflex and conduction of painful impressions in locomotor ataxia. Out of nineteen cases examined, there was retardation in fifteen, and normal conduction in four, in the lower extremities, and in these last he still found the tendon reflex, and normal condition of the bladder, both of which were lacking in the others. One case, which formed the transition between the others, exhibited a peculiar condition ; on one side there was impaired tendon reflex and pain-conduction, and on the other, the normal conditions. On physiological grounds, he thinks that in these cases, with the normal tendon reflex and conduction, the morbid process is confined to the posterior columns without implication of the gray substance.

II. A symptom first described by Leyden and more recently mentioned by Remak, is the separation in time of the perceptions of tact and pain in simple prick with needle. It indicates a simple diminution of the cross section of the gray substance with still functioning posterior columns. Among the fifteen cases with retarded pain-conduction, Fischer found this double sensation in eight. The examination for this phenomenon revealed a curious anomaly in the cutaneous reflexes. The normal reflex acts, as is well known, according to Pflueger's law along the motor nerves from that point of the cord where the sensory nerves excited join it. With stronger excitations it reaches still higher spinal cen-

tres, and motor nerves are involved which arise from points in the cord much higher than the junction of the irritated sensory nerves. With very strong excitations, through the medium of cerebral sensibility, a centrally-started reflex may take place, closely resembling voluntary movement. The author observed various complications of reflexes and retardations in tabes :

1. Two cases of retarded pain-conduction without double sensation and without any reflex ; the first had pronounced hyperalgesia, and the second, muscular paresis. The lack of reflex activity was, in the first case, based upon disease of the central portion of the reflex arch ; in the second, on disorder of its peripheral portion.

2. Three cases of retarded pain-conduction without double sensation showed reflexes combined with conscious voluntary reaction. The spinal reflex act is the product of a cerebral transmission process.

3. One case of retarded pain-sense without Remak's symptom gave a reflex synchronous with the prick. The sensory excitation thus reached the normal spinal reflex centre.

4. Two cases of retarded pain-sensation with Remak's double sensation symptom gave reflexes synchronous with the consciousness of pain. The primary reflex arch in these cases was out of order, and the reflex must be considered as having a cerebral origin.

5. In one case with retarded pain-sense and double sensation the reflex occurred at the same time as the prick and the corresponding tact sensation. This corresponds with normal reflexes as in 3.

6. In some cases with retarded pain-sense and Remak's double sensation the reflex occurred both at the point of contact and tact sensation, and at that of pain. In these cases the first is the spinal reflex, and the second is cerebral.

Of course, these varieties do not include all cases ; there is every variety of transition between them.

III. In some patients the author discovered a remarkable condition of the sense of locality. With simple contact of one point of the æsthesiometer, they felt the sensation of two, and with both, that of four or five points (polyæsthesia). The explanation of this is not clear. There is possibly an abnormal irritability of the gray substance, so that a wave of irritation entering a ganglion cell of the posterior horn extends itself, not merely in a central direction, but laterally through the fine nervous network, and

is diffused into neighboring ganglions, which are connected with other centripetal routes from the periphery. This would produce to consciousness the impression of contact at each of these points connected with these ganglion cells. In this manner, the author explains the case of two patients who, when brisk contact-impressions were produced on one leg, always felt it also in the other.

MM. Debove and Boudet, of Paris, *Archives de Neurologie*, i, p. 42, experimenting with a new apparatus, the myophone, invented by one of themselves, which gives the sound of the muscles in contraction and at rest, found a decided inequality in the tonicity of different groups of muscles in ataxics, which had begun to display the symptom of incoördination. It was not noticeable in those cases characterized only by the frequent pains of the incipient stages of the disease. They explain the incoördination of this disease by this lesion of tonicity, which in turn is accounted for by the disease of the posterior roots, as the section of these, experimentally, in animals, produces locomotor troubles referable to loss of muscular tonicity. They cannot, in those cases, be assimilated to those of ataxics, because in the latter we have only inequality of tonicity, not complete loss of tonus; but the principle is the same in both. MM. Debove and Boudet notice briefly the theories of the incoördination in tabes: that of Tschiriew who attributed it to loss or diminution of muscular tonus; that of Pierret, who considered it to be caused by limited muscular paralysis; that of many authors, who have considered it due to loss of general sensibility; and after an analysis of the facts of the movements of ataxics, conclude that "the incoördination of tabetics is due to an unequal tonicity of their muscles, the effects of which are diminished by the maximum contraction of these muscles."

They do not refer to the idea largely held, and which seems to us rational, that the loss of the muscular sense has much to do with the incoördination. We are still inclined to attribute it, in part at least, to this deficiency.

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FUNCTIONAL ISCHÆMIA OF THE BRAIN.—Prof. Ball, of Paris, read a paper, at the last meeting of the British Medical Association, on this subject, which is given in full in the *British Medical Journal* of October 30th. In it he relates and discusses three interesting cases, which may be summed up as follows: The first